Supplementary Information for

Land-use intensification decouples biodiversity and ecosystem function in urban greenspaces across the Iberian Peninsula

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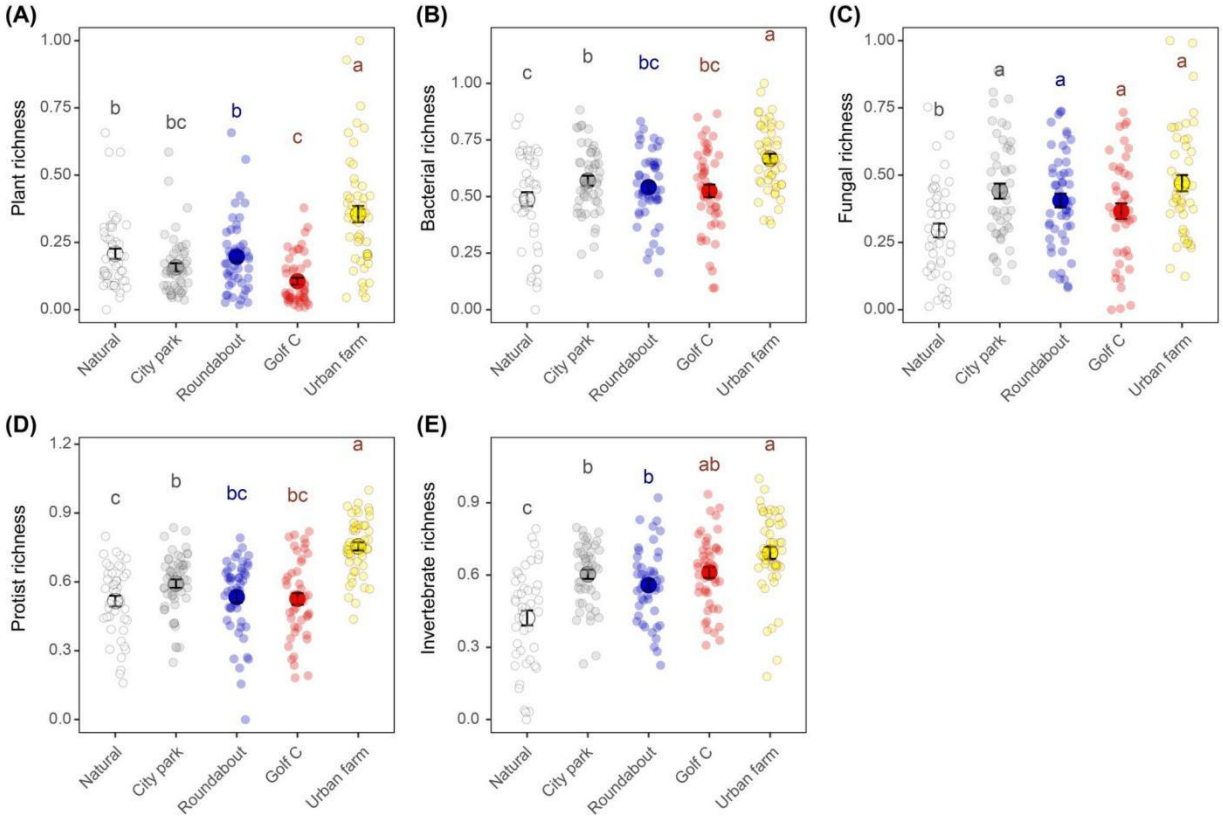
Table S1. Description of the environmental variables or attributes included in each ecosystem service and their importance.

Ecosystem service		Variables	Importance
Functions	Plant growth	Mean normalized difference vegetation index (NDVI)	Net primary productivity of plants
	Habitat suitability	Plant habitat complexity and	Ability of soils to sustain active microorganisms and complex plant communities
	Soil stability	Cover of plants, bryophytes and lichens	Vegetation stabilizing the soil and helping against soil erosion
	Carbon sequestration	Soil organic carbon stocks, Carbon stored in trees and in dominant leaves	Carbon stored in soil and vegetation
	Organic matter decomposition	Enzymatic activity of β-glucosidase, cellulase, β-N-acetylhexosaminidase, and phosphatase, and soil basal respiration	Microbial activity in soils able to decompose soil organic matter
	Soil fertility	calcium, potassium, phosphorus, sulphur, magnesium, total inorganic nitrogen (NH_4+NO_3), total nitrogen, iron, boron, manganese, and molybdenum	Cycling of elements that are plant macronutrients
	Symbiosis	Relative abundance of ectomycorrhiza and arbuscular mycorrhiza	Plant-fungal mutualism
	Pathogen control	Relative abundance of plant pathogenic fungi	Fungal pathogenicity for plants. Plant health
	Water regulation	Soil water holding capacity	Ability of soils to retain water
	Animal / pet service	Fungal animal parasites and abundance of animal feces	Potential risks for and derived from pets and animals
Biodiversity	Plant and soil biodiversity	Richness of plants, bacteria, fungi, protists and micro-invertebrates	Soil sustaining macro- and micro-biodiversity



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70 **Figure S1. Land-use intensification alter plant and soil biodiversity.** The effect of land use on
71 plant richness (A), bacterial richness (B), fungal richness (C), protist richness (D) and invertebrate
72 richness (E). Different letters within each panel indicate significant differences in EMF or biodiversity
73 values among land-uses (Tukey post-hoc tests, $p<0.05$, after GLMM with "city" as random factor).
74 ANOVA with F test, the sampled city was used as a random factor.

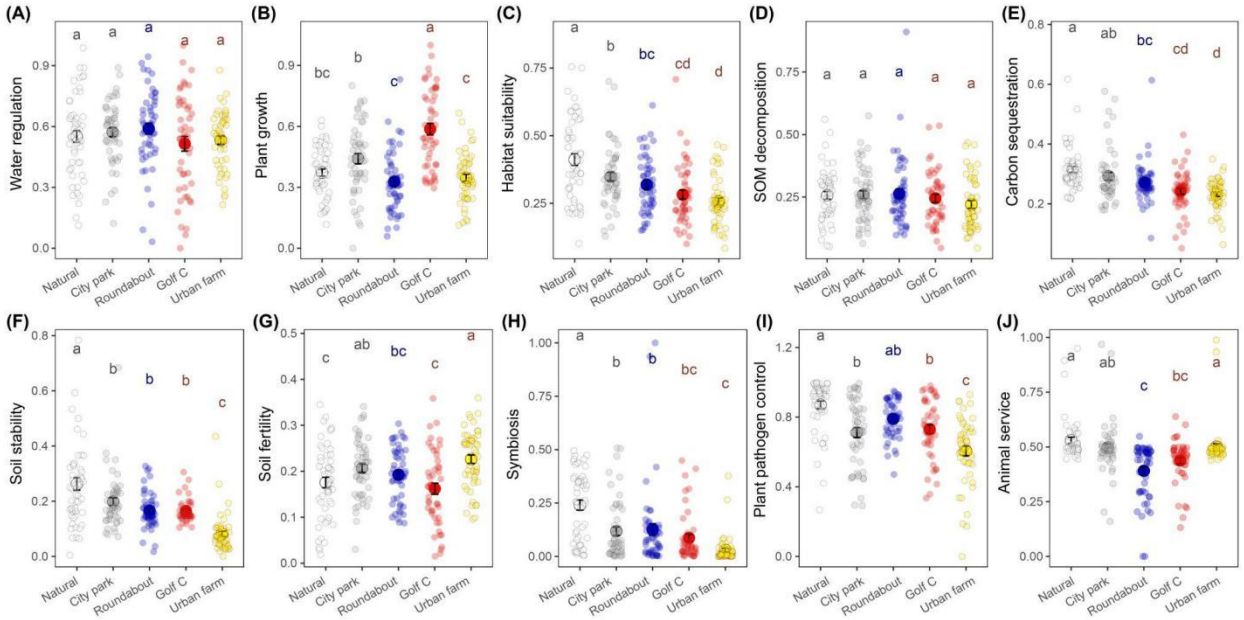

Figure S2. Land-use intensification alter ecosystem functions. The effect of land use on water regulation (A), plant growth (B), habitat stability (C), SOM decomposition (D), carbon sequestration (E), soil stability (F), soil fertility (G), symbiosis (H), plant pathogen control (I) and animal service (J). Different letters within each panel indicate significant differences in EMF or biodiversity values among land-uses (Tukey post-hoc tests, $p<0.05$, after GLMM with "city" as random factor). ANOVA with F test, the sampled city was used as a random factor.

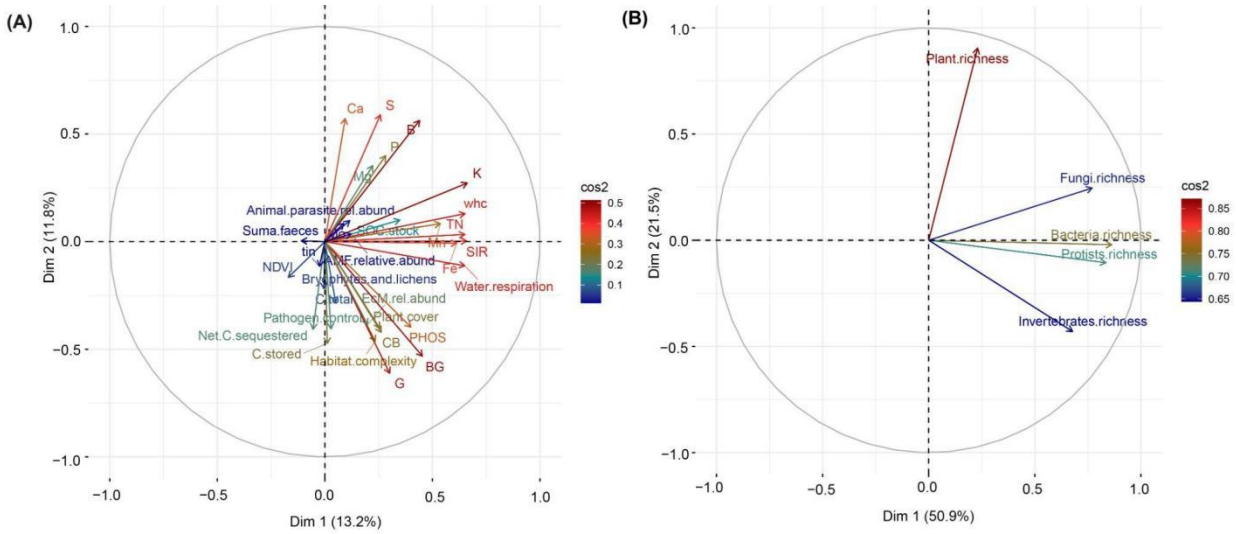

Figure S3. Effects of Land-use intensification on the multidimensionality of multiple ecosystem services. Principal Component Analysis (PCA) of ecosystem functions (A), with multifunction dimensions (mD1 and mD2) explaining a combined 25% of variation. Principal Component Analysis (PCA) of biodiversity (B), with multibiodiversity dimensions (mD1 and mD2) explaining a combined 72.4% of variation.

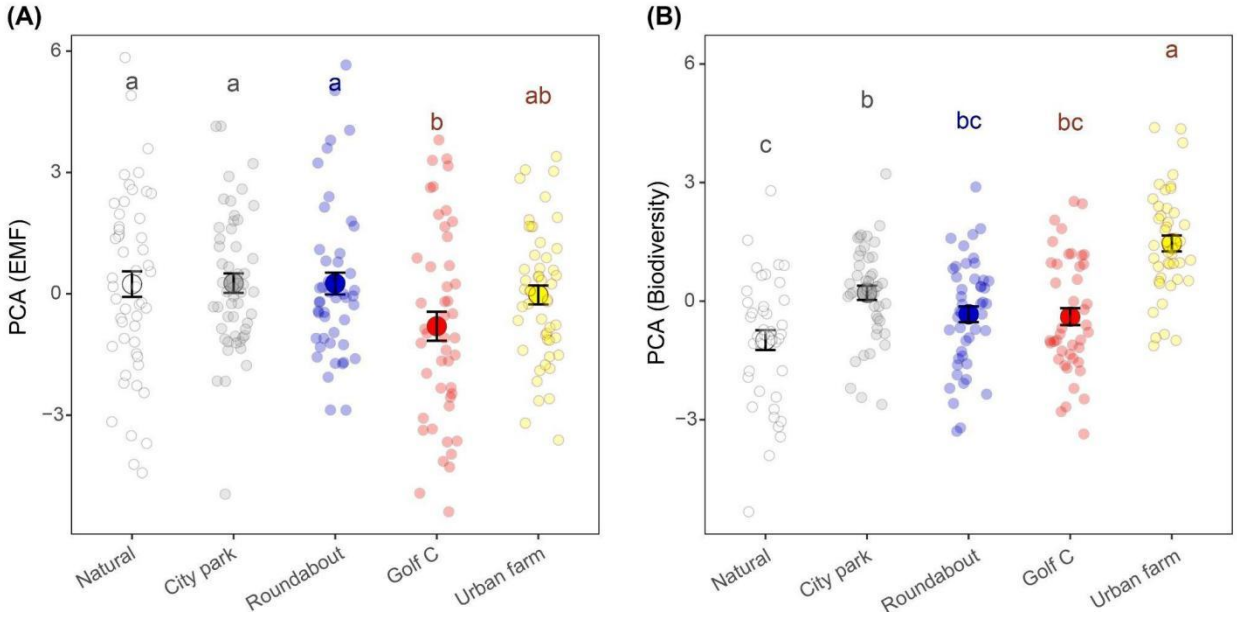

Figure S4. Effects of Land-use intensification on the multidimensional 1 (Dim 1) of multiple ecosystem functions (A) and biodiversity (B). Different letters within each panel indicate significant differences in EMF or biodiversity values among land-uses (Tukey post-hoc tests, $p<0.05$, after GLMM with "city" as random factor). ANOVA with F test, the sampled city was used as a random factor.

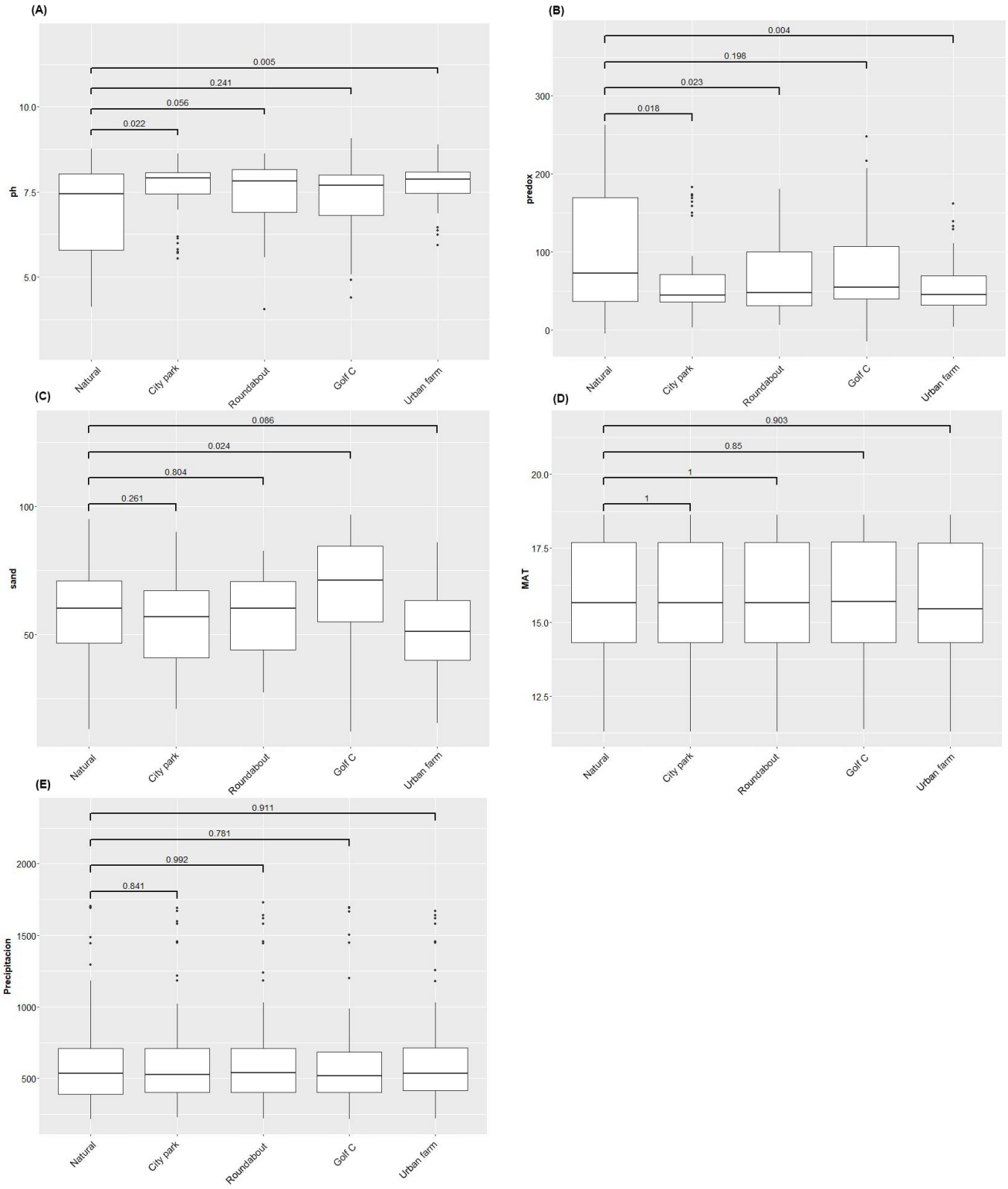

Figure S5. The environmental predictors associated the five land use type in urban greenspaces across the Iberian Peninsula. A) pH; B) predox; C) Sand; D) MAT; E) Precipitation. The number above the box was *p* value.